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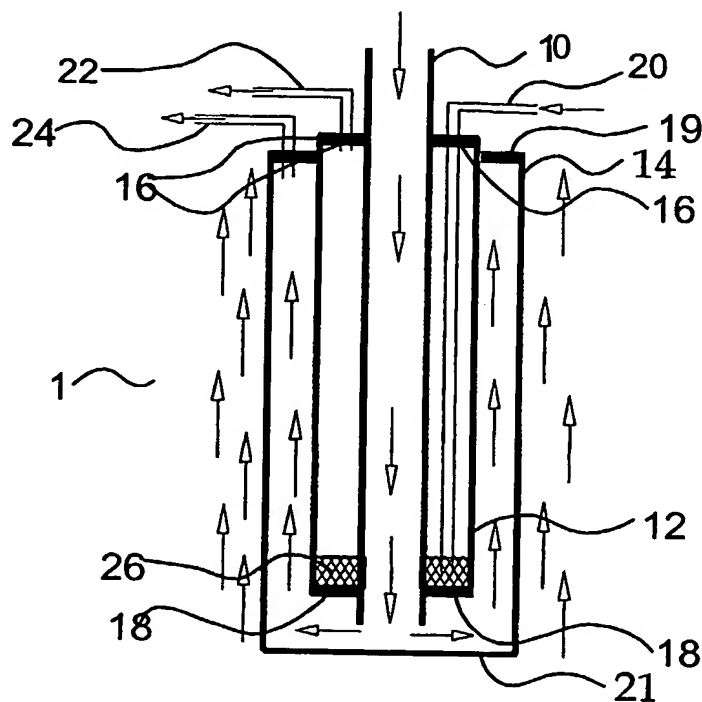
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[Continued on next page]

(54) Title: COMPACT SOLID OXIDE FUEL CELL STACK



(57) Abstract: A solid oxide fuel cell stack comprises a plurality of tubular solid oxide fuel cells each comprising concentric inner and outer electrode layers sandwiching a concentric electrolyte layer. The fuel cells extend in the same direction and are arranged in a cluster with at least one fuel cell having an electrolyte layer with a different composition and different maximum operating temperature than another fuel cell in the cluster. The fuel cell having the electrolyte layer with a higher maximum operating temperature is located closer to the core of the cluster than the fuel cell having the electrolyte layer with a lower maximum operating temperature.

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INTERNATIONAL SEARCH REPORT

International Application No.

P 03/01992

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01M8/12 H01M8/24 H01M8/12 H01M8/24 H01M8/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, COMPENDEX, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 458 477 B1 (HSU MICHAEL S) 1 October 2002 (2002-10-01) column 3, line 57 - line 64 column 4, line 19 - column 5, line 8 column 7, line 20 - line 23 column 8, line 41 - line 56 column 12, line 62 - column 14, line 54 figures 3,4 claims 28,29,68-70,114,115,142,143	1-17
X	WO 01/71841 A (US ENERGY ; MICHAEL A COBB & COMPANY (US)) 27 September 2001 (2001-09-27) the whole document	18-25
Y	----- -/--	26-37

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

5 January 2005

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01/86030 A (ALBERTA RES COUNCIL ; SARKAR PARTHO (CA)) 15 November 2001 (2001-11-15) claims 17-22	26-37
P,A	WO 03/001624 A (PALL CORP) 3 January 2003 (2003-01-03) claims 20-26 paragraph '0256!	26-37
A	EP 0 320 087 A (WESTINGHOUSE ELECTRIC CORP) 14 June 1989 (1989-06-14) figures 1,2	18-25

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 03/01992

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-17

the solid oxide fuel stacks of claims 1 to 17

2. claims: 18-25

the solid oxide fuel stack of claims 18 to 25

3. claims: 26-37

methods of manufacturing a solid oxide fuel cell elements

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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